

Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in this application:

Listing of Claims

Claim 1 (canceled)

Claim 2 (new): A method of transmitting at least one digital code over a network carrying AC current comprising:

transmitting a signal corresponding to the code over the AC current network using the AC current for determining timing of transmission,

wherein, for each code, the signal is a sum of sine waves of several frequencies with phases selected between 0 and 2π for each frequency,

wherein the same frequencies are used for all codes, and

wherein the set of phases is unique for each code.

Claim 3 (new): The method of Claim 2, wherein the signal for at least one code is transmitted from storage.

Claim 4 (new): The method of Claim 2, wherein the phases are selected to minimize the crest factor of the signal.

Claim 5 (new): The method of Claim 2, wherein the phases are selected randomly or pseudo-randomly between 0 and 2π .

Claim 6 (new): The method of Claim 2, wherein the frequencies are equidistant.

Claim 7 (new): The method of Claim 2, wherein the at least one digital code identifies a transmitting device.

Claim 8 (new): A method of detecting transmission at least one digital code over a network carrying AC current comprising:

for each code, determining a phase φ_i between 0 and 2π for each of several frequencies f_i so that the set of phases is unique for each code;
receiving a signal over the AC current network using the AC current for determining timing of transmission;
for each frequency f_i determining a complex Fourier coefficient of the signal C_i ;
calculating a sum by adding for each pair (i, i-1)
 $\text{sign}(\text{Re}(C_i \cdot (C_{i-1})^* \cdot \exp(-j \cdot (\varphi_i - \varphi_{i-1}))))$; and
detecting the digital code when the sum is higher than a threshold.

Claim 9 (new): The method of Claim 8, wherein the phases are selected to minimize the crest factor of the signal.

Claim 10 (new): The method of Claim 8, wherein the phases are selected randomly or pseudo-randomly between 0 and 2π .

Claim 11 (new): The method of Claim 8, wherein the frequencies are equidistant.

Claim 12 (new): The method of Claim 8, wherein the at least one digital code identifies a transmitting device.